Description

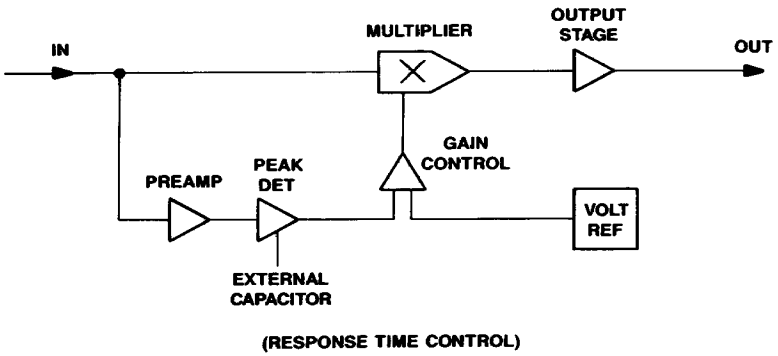
The LB1026AA/AB is a voice frequency level expander used to condition amplified signals from electret-type microphones in telephone handsets. The function of this device is to attenuate low-level signals that typically originate from background noise, and pass normal amplitude speech signals at unity gain. With this device the quality of conversation is enhanced for both the speaker, by way of receiver sidetones, and the listener, by reducing background sounds that might be heard during the speaker's silence. This device is particularly suited for office and industrial telephone applications where the suppression of undesirable background noise during lulls in conversation is desired.

A 1.0 μF response-time control capacitor must be provided by the user if the specified attack and decay times are to be obtained. The LB1026AA is supplied in wafer form to the customer, who is responsible for the subsequent processing to obtain a usable device. Each chip has six pads for wire bond attachment (Figure 4).

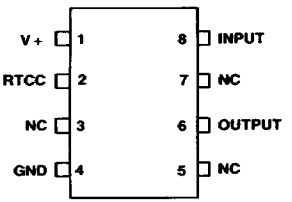
Features

- Reduces transmitted background noise during pauses in conversation
- Provides unity-gain transmission of normal amplitude voice signals
- Operates from 2 to 15 V power supply
- Available in wafer form (LB1026AA) and 8-pin plastic DIP (LB1026AB)

Functional Diagram



Pin Diagram



Maximum Ratings

At 25 °C

Stresses exceeding the values listed under Maximum Ratings may cause permanent damage to the device. This is an absolute stress rating only. Functional operation of the device at these or any other conditions in excess of those indicated in the operational sections of this data sheet is not implied. Exposure to maximum-rating conditions for extended periods of time may adversely affect device reliability.

Rating	Value	Unit
Operating Voltage (V+ to Ground)	**25**	**V**
Temperature Storage Range	−40 to +125	°C
Pin Temperature (Soldering, 15 s)	300	°C
Ambient Operating Temperature Range	0 to 50	°C

Electrical Characteristics

(T_A = 25 °C unless otherwise specified)

The test circuit shown in Figure 1 applies for all tests.

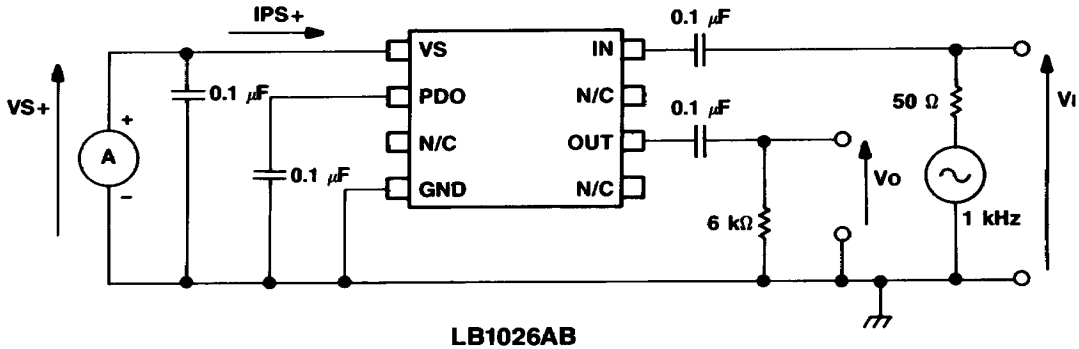
Parameter	Min	Typ	Max	Unit
Power Supply Voltage	2.0	—	15	V
Power Supply Current at 15 V	—	—	1.0	mA
Power Supply Current at 3.0 V	—	—	700	μA
Output Voltage, R_L = 6k ohms*	—	—	1.0	V_{PP}
Maximum Input Gain Ratio (Input = 353 mVrms, pin 8)	0.94	—	1.15	—
High-Level Gain Ratio (Input ≥ 50 mVrms)	0.94	—	1.1	—
Mid-Level Gain Ratio (Input = 12.5 mVrms)	0.38	—	0.6	—
Low-Level Gain Ratio (input = 1.0 mVrms)	0.19	—	0.28	—
Attack Time†	10.5	—	17.5	ms
Decay Time‡	105	—	175	ms
Input Resistance	—	25	—	kΩ

* With less than 3% THD.

† Attack time is defined as the time required for the output voltage (Vo) to settle within 90 to 100% of the steady-state output voltage after the input voltage (Vi) is changed in less than 1.0 ms. from 3.16 mVrms to 31.6 mVrms.

‡ Decay time is defined as the time required for the output voltage (Vo) to settle within 100 to 110% of the steady-state output voltage after the input voltage (Vi) is changed in less than 1.0 ms from 31.6 mVrms to 3.16 mVrms.

Test Circuit



LB1026AB

Figure 1. LB1026AB Test Circuit

Pin Description Key

Pin	Symbol	Name/Function
1	V+	Connection for the power supply voltage
2	RTCC	Response Time Control Capacitor
3	NC	No Connection. This pin should not be used as a tie point.
4	GND	Circuit common. Not necessarily physical or system ground.
5	NC	No connection. This pin should not be used as a tie point.
6	OUTPUT	Device output. This connects to subsequent telephone speech network circuitry.
7	NC	No connection. This pin should not be used as a tie point.
8	INPUT	Input signal

Application

The following information summarizes the basic operation of a voice frequency level expander in electret-type microphone applications.

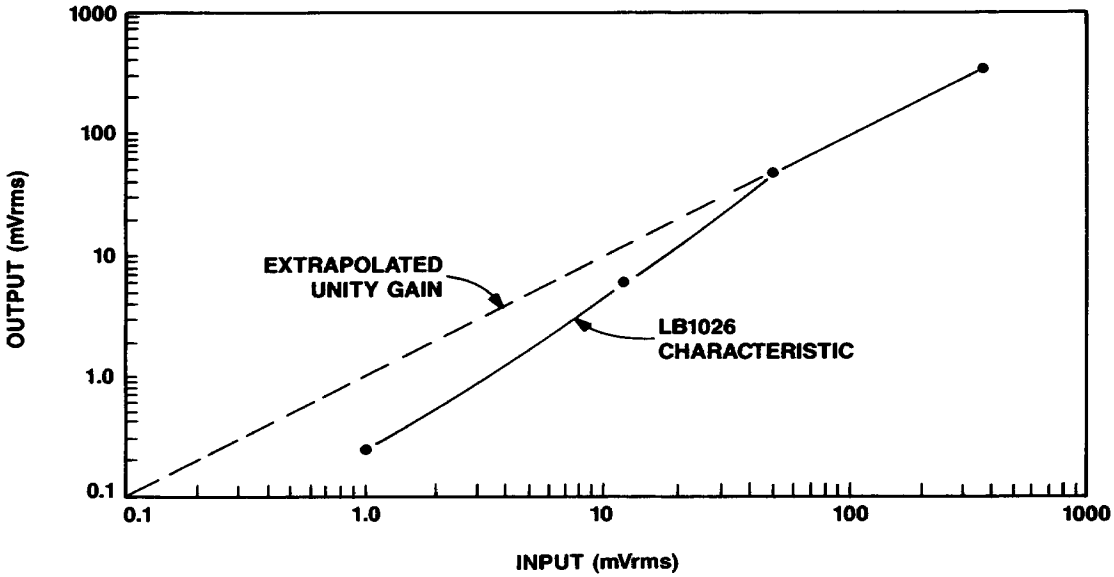


Figure 2. Typical Expander Characteristics

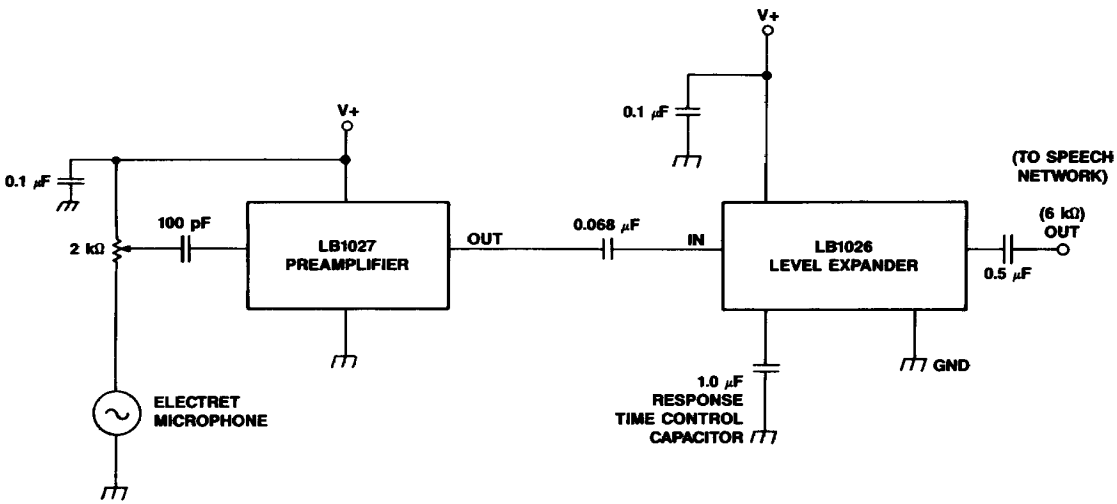
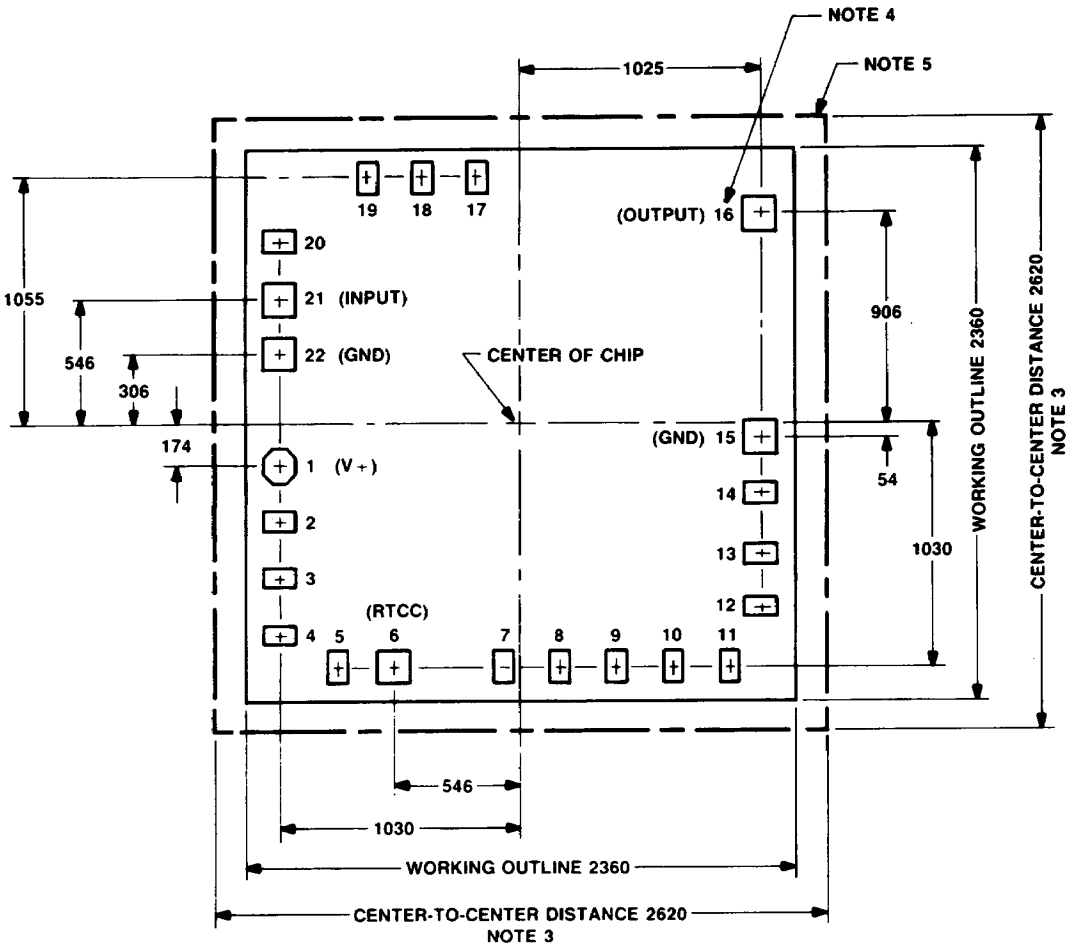


Figure 3. LB1026AA/AB Level Expander Application Diagram

Outline Drawings

(Notes 1, 2)



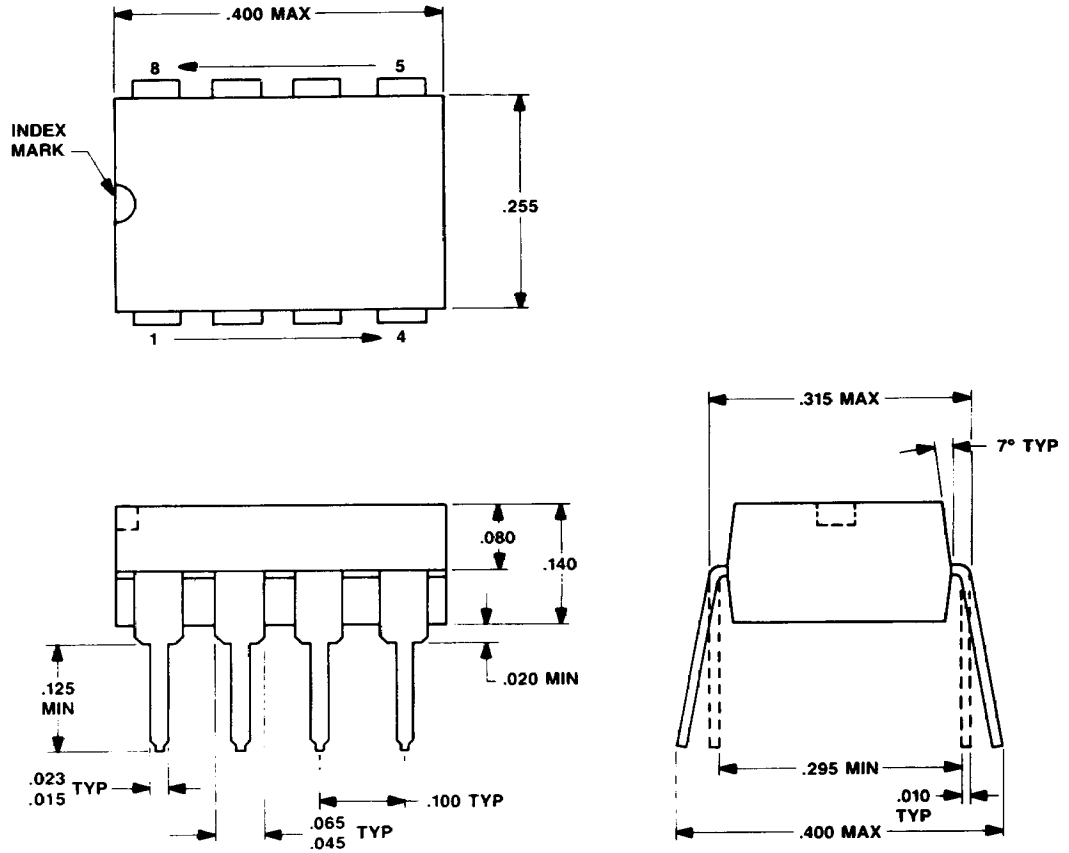
Notes:

1. All dimensions are shown for reference only.
2. Bonding pads 1, 6, 15, 16, 21, and 22 are 140 x 140 microns. Bonding pad #1 is a reference point and can be identified by its octagon shape; e.g. 2, 3, 4, etc. are located by counting CCW from bonding pad #1. Refer to Figure 4 for description and dimension locations. All other pad numbers are used by AT&T during wafer fabrication to trim the circuit. They are not to be used as bonding pads. The dimensions of the pads are 80 x 140 microns.
3. The actual chip size equals the center-to-center dimension less the saw kerf width, typically 50 to 70 microns.
4. Chip pad numbers are for reference only and do not appear on the chip. The complete metallization pattern is not shown.
5. The thickness may vary as determined by the wafer diameter used in fabrication. However, the thickness dimension shall be in the range of 480 microns (0.0188 inch) minimum and 700 microns (.0275 inch) maximum.

Figure 4. LB1026AA Wafer Drawing (Dimensions in Microns)

Outline Drawing
(Dimensions in Inches)

8-Pin Plastic DIP (LB1026AB)



Note: Pin numbers are shown for reference only

Ordering Information

Device	Comcode
LB1026AA	104208970
LB1026AB	104208988